Total knee arthroplasty (TKA) infections eliminated and rehabilitation improved using polymeric membrane dressing circumferential wrap technique: 120 patients at 12-month follow-up

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OBJECTIVES

To reduce the infection rate after total knee arthroplasty (TKA) from 7% towards 0% by moving from gauze dressing to a system consisting of polymeric membrane dressings* (PMDs) and polymeric membrane wraps† (PMWs). To evaluate the reduction of inflammation, swelling and pain by use of this system.

METHODS

120 severe TKA patients were studied over an 18-month period. PMDs were applied in theater over incision site, and knee wrapped with PMW. Four days post-operatively dressing change was performed. Circumferential swelling (around mid-line patella) and pain (VAS, 0-10) measurements were taken at day five.

Post-operative physical therapy rehabilitation took place three times per week for six weeks. Wraps were replaced weekly and continued though rehabilitation. Movement measurements made according to Knee Society Score (KSS) and Lower Extremity Function Score (LEFS). The patient and family removed the wraps and re-applied in order to accommodate bathing.

RESULTS

Post-operative swelling was reduced by 20% (average). Pain score was reduced from score 6.5 to 3 (VAS). Wounds were often fully epithelialized at day 3 vs. previously at day 5, reducing the risk of infection introduced during dressing changes. There were zero infections at 12-month follow-up. This stayed at 0% for all patients followed up again at 18 months. Rehabilitation was also improved through reduced pain and inflammation for the patients, allowing them to complete their strengthening program more effectively. All knees were rated Fair to Poor using the KSS pre-operatively. The patients made considerable improvement to 75% and above using the LEFS.

CONCLUSION

PMDs and wrap technique seems to eliminate wound breakdown and post-operative joint-infection, while at the same time significantly reducing patients' pain. Reduction in inflammation and swelling improved rehabilitation compared to previous protocols. While this is very encouraging, a more statistically valid conclusion will be sought through an RCT.

DISCUSSION

Our long-term experience with total knee arthroplasty (TKA) had brought us many problems with post-operative infections and thus hurdles for the post-TKA rehabilitation, including increased cost of stay in hospital for a prolonged period of time.

The use of polymeric membrane dressing post-TKA has lowered the prevalence of surgical site infections significantly. The overall outcome of zero infections in 120 TKAs, even in uncontrolled diabetes, has greatly improved post-TKA outcomes in our patients.

The use of PMDs has also reduced the overall pain score post-operatively, probably due to significant reduction in inflammation and swelling around the incision sites; thus, enabling patients to have more efficient post-TKA rehabilitation and be less reliant on analgesic pain relief.

Using PMDs has shortened the hospital stay, lowered the hospital bills and, most importantly, has provided great satisfaction in the majority of our TKA patients due to good functional outcomes.

REFERENCES

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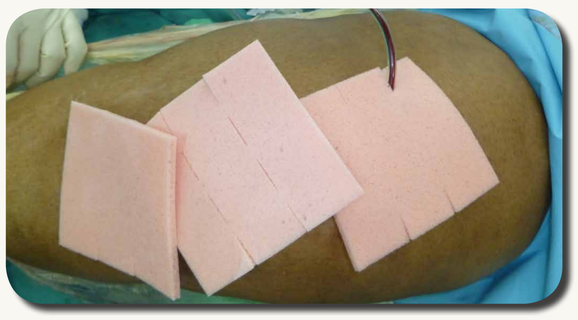
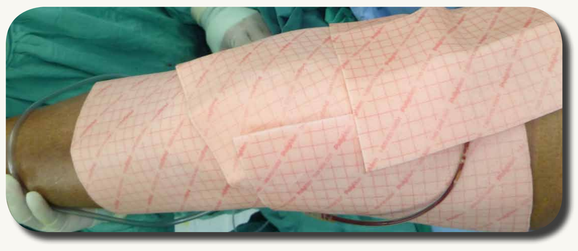
CASE 1 – 63-year-old female underwent right total knee replacement. Primary dressing with polymeric membrane.

Intra-operative
Surgical site ready for polymeric membrane dressing

Day 3 post-operative
There was mild swelling at the operative site. However the wound was clean. There were no signs of superficial or deep infection and no bruising visible as was the case with gauze dressings

Day 14 post-operative
There is no swelling noted. The surgical wound was healthy and clean. The wound is ready for sutures removal.





CASE 2 – 64-year-old female with long history of uncontrolled diabetes with severe left knee osteoarthritis that warranted her for left total knee arthroplasty surgery. Her pre-op HbA1c was 10.1%. In view of high risk of infection, polymeric membrane dressing was chosen for her.

Intra-operative
Surgical site ready for polymeric membrane dressing

Week 6 post-operative
The surgical scar at 6 weeks post-operatively had healed uneventfully. No signs of surgical site infection despite uncontrolled diabetes

*PolyMem and †SportsWrap are manufactured by Ferris Mfg. Corp. Fort Worth, Texas 76106 USA

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